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THESIS

MANAGING GROWTH AND NEW WORK IN CONTRACTS FOR THE REPAIR AND OVERHAUL OF U.S. NAVAL VESSELS IN PRIVATE SHIPYARDS

by

Robert Vincent Law

December 1981

Thesis Advisor: J. W. Creighton

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Managing Growth and New Work in Contracts for the Repair and Overhaul of U.S. Naval Vessels in Private Shipyards

by

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

The U.S. Navy's procedures for repairing and overhauling Naval vessels in private shipyards is presented as an overview. Particular attention is given to the problems the Navy has experienced in controlling overhaul schedules and costs, and in distinguishing between growth changes and new work changes in overhaul contracts. Recommendations include procedures for standardizing definitions for growth and new work among Navy activities; simplifying current overhaul reporting procedures; and upgrading the quality of personnel assigned to overhaul contract administration functions.

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I. INTRODUCTION

Contracting for ship repair and overhaul work has traditionally been a difficult task, a task that has been compounded by the Navy's desire to use firm fixed price contracts for requirements that cannot be accurately and completely identified prior to the solicitation of bids from private shipyards. Once a contract is formed and work has begun, contract changes are normally required for work not specifically identified in the original solicitation. These changes frequently cause overhaul costs to significantly exceed original estimates. The changes can generally be grouped into the categories of either growth, meaning growth in a job previously identified in the contract, or new work, meaning work that is now required that was not included in the original contract.

"Growth and new work" has become something of a self contained phrase with a variety of meanings. To the Navy contract administrator it means a need to process a multitude of urgent contract changes with all the attendent administrative headaches. To the Navy auditor it means looking for new work changes that should have been processed and funded as new procurements, but were instead buried as growth changes. To the type commander it means unacceptable overhaul delays and unaffordable cost overruns. To the

private shipyard it means both the opportunity for additional profits and the potential for seemingly endless problems. So many meanings have evolved for the terms growth and new work that the words have become too vague to be meaningful. Not surprisingly, the call for better definitions is frequently heard both within the Navy and from the private sector.

For purposes of this paper the terms growth and new work will be used in the more traditional sense, defined as follows. Growth is the term used to categorize a change to a current repair or overhaul contract when the change is within the scope of the contract. Growth changes do not involve new procurement. Any changes that do not meet these criteria should be categorized as new work. New work requirements should be processed as new procurements, using current fiscal year funds, while growth changes may be funded using funds originally established for the initial procurement, even if those funds have expired for obligation purposes. In essence, a new work change to an overhaul contract is technically a new procurement, while a growth change is considered within the scope of the original contract. [1:16]

These seemingly simple distinctions between growth and new work belie the controversy encountered with the terms, a controversy that has impacted the way ship overhaul contracts are managed, controlled, and evaluated, as well as the way the Navy conducts its business with ship repair

contractors. Many people have criticized the Navy's management of growth and new work in ship overhaul contracts, and many solutions have been proposed for solving the resulting problems. But rather than solving problems, the proposed "solutions" seem to underestimate the complexity of the issues associated with growth and new work, and rely on shifting the burden of the problems to someone else. Needless to say, those solutions have not been greeted with universal enthusiasm.

The purpose for this paper is to explore the nature of the problems of growth and new work, to discuss why the issue is a complex and difficult problem which pervades the overhaul process, and to explain why the results from many of the proposed solutions for managing growth and new work attempted so far have been so largely disappointing. The paper concludes with recommendations for approaching the issue of growth and new work--recommendations which, unfortunately, are neither neat nor easy.

Two circumstances contributed most to the methodology used in structuring this thesis. First, the topic of growth versus new work encompasses virtually the entire spectrum of the ship overhaul process, from the initial decisions regarding how Navy ships should be maintained to the settlement of final contract disputes and claims. Secondly, unlike the new construction environment, which has been and continues to be the subject of numerous investigations and

studies, ship overhauls have not yet become the topic of extensive study and research.

The limitations of a single thesis require that the chosen research topic be covered either narrowly and in depth or very broadly with little detailed analysis of any one area. Because of the nature of this topic and the lack of any previous studies upon which to build, it was decided that if this paper is to provide the background and framework necessary to explain the growth and new work problem, the overview approach would be most appropriate. This paper therefore explains the growth versus new work question as part of the ship overhaul process rather than as a question that can be extracted and analyzed apart from that process. The decision to structure the paper as an overview was reinforced when it was discovered during initial research that, while many people who work with ship overhauls are familiar with the process within the limitations of their individually assigned tasks, few people really have an understanding of the rationale behind why the system works as it does. It was therefore felt that the inclusion of a chapter dealing with a general discussion of the mechanics of overhauls would contribute to the continuity of the discussion of growth and new work.

The network that exists for the repair of Naval vessels is, of necessity, quite adaptable to the multitude of circumstances in which it is necessary to accomplish repairs.

This study has not attempted to differentiate among the vast combinations of situations in which repairs are accomplished. The procedures the Navy uses for overhauling its vessels that are included in this discussion are presented as the most common way ship overhauls are presently conducted. There are numerous examples of exceptions to these procedures, some of which are required to accommodate unique circumstances surrounding specific repair problems and some of which are undertaken in an effort to find a way around the many problems confronting ship overhauls.

Included in this thesis is a brief discussion of the chain of command that most directly affects ship overhauls and is most visible to those managers who work closely with the ship repair effort. The discussion is intended as a framework that must be constructed prior to discussing the issue of growth and new work. It is not intended as a comprehensive study of ship overhaul management and control.

This review of the overhaul process is particularly directed at the problems encountered during the repair of Navy non-nuclear surface ships overhauled in private shipyards. While the summarization of the overhaul process that follows is, of necessity, abbreviated, this should not be interpreted as an over-simplification of that process. There are few tasks facing the government contracting officer today that are as difficult or complex as the challenges that are encountered during the award and administration of

contracts for the repair and overhaul of Navy ships. The discussion presented here can only summarize most of the significant factors that affect that process. While this presentation may be tedious for those more familiar with the overhaul process, the overview is considered necessary to develop a basic tenet of this thesis--that the problems encountered from growth and new work contract changes are intrinsic to the overhaul process, and that those problems can be addressed only by addressing the overhaul process itself.

II. GROWTH AND NEW WORK: THE PROBLEM

Despite significant efforts aimed at bringing more discipline to the ship overhaul process, uncontrolled costs and schedule slippages during the repair and overhaul of Navy ships in private shipyards have, in recent years, become the norm rather than the exception. Many efforts to identify ship overhaul problems have been attempted and some progress toward improving the process has been made. This search for problems and solutions has, at times, deteriorated into circuitous arguments of fault-finding between the Navy and civilian shipyards, while moving the parties no closer to a solution.

UNCONTROLLED GROWTH IN SHIP OVERHAULS

Examples of the problems facing ships in overhaul are not difficult to find. In reviewing figures for overhauls completed in fiscal year 1980, the effect of these problems can be seen. Fifty-one non-nuclear surface ship overhauls were completed during that period. While the original cost estimates for those overhauls totalled about $436 million, actual final overhaul costs exceeded this amount by almost $112 million--25.6 percent in excess of the original estimates. Additionally, of those fifty-one ships, only eighteen completed their overhauls on or before schedule. Thirty-three of the ships were delivered late. [2]

Figures for fiscal year 1981 show little, if any, improvement. Of twenty-one ship overhauls completed in the first two quarters of FY81, fifteen ships were delivered late. Two of those ships, the minesweeper CONSTANT and the USS FORT SNELLING, were summarized in Naval Sea Systems Command's management reports as follows.

The Long Beach Supervisor of Shipbuilding (SUPSHIP) estimated that the total overhaul for the minesweeper CONSTANT (MSO-427) would cost approximately $868,000. The contract was awarded to Larson Boat Shop of Terminal Island, California, at a cost of $1.111 million. The final overhaul eventually totalled $1.731 million--almost twice the original estimate. The CONSTANT was delivered thirty-five days late.

It was estimated by SUPSHIP Portsmouth that the entire overhaul for the USS FORT SNELLING (LSD-30) would total $16.0 million. The contract was competitively bid and awarded to Bethlehem Steel for $20.0 million. The overhaul was finally completed in the first quarter of FY81 at a total cost of $30.1 million. The ship was delivered one hundred sixty-four days late.

Certainly, changes to overhaul contracts are expected. While overhauls for those fifty-one ships in fiscal year 1980 were estimated to cost $436 million, the initial contract awards for those ships totalled only $336.3 million. The SUPSHIPs expected an increase of about $100 million, or

thirty percent, in growth and new work changes to those contracts. Actual costs for contract changes eventually totalled $211.4 million--over twice the amount expected. With almost forty percent of all ship overhaul dollars being spent for contract changes, it is apparent that growth and new work affects virtually every facet of ship overhauls.

Even more significant than these recorded charges to overhaul costs are the invisible costs encountered in delaying the return of ships to the fleet. These expenses, involving additional payroll, housing and travel expenses that are required for maintaining ships' crews and their families at overhaul sites, the additional administrative expenses required in rescheduling other affected overhauls, as well as the loss of ships to the fleet during the unplanned extensions of overhauls, cost the Navy many times over the charges that are billed to those overhauls. During a time when ships are being recalled from the inactive reserve fleet to meet force requirements, the need to minimize time spent in overhauls has become especially critical.

Given the cost and schedule problems that exist in ship overhauls, the obvious questions are who is responsible for this condition and what is being done to correct it. The answers are both simple and complex. Responsibility is distributed among so many factions, groups, and individuals that no one can really claim full responsibility for ship

overhauls. As a result, corrective action is difficult to initiate and almost impossible to effect.

Many solutions to existing problems have been proposed. Some suggestions, such as assigning all ship overhaul work to Navy controlled shipyards, or excluding the marginally performing private yards from participation in Navy contract work, have an emotional, if not an intuitive, appeal. Other proposals, such as the avoidance and elimination of unnecessary contract changes, and the deferral of all but urgently required new work into later availability periods, have been promulgated as policy in Chief of Naval Operations and type commander directives. Yet the same problems seem to remain year after year. Experience has shown that significant contract changes occur in even the most tightly controlled overhauls, and that political, financial, and economic realities dictate that the Navy will continue to do business with the private sector, which includes doing business with all too many marginal performers.

This is not to say that solutions do not exist, but only that many of the solutions attempted invariably seem to result in a stalemate. This stagnation in the search for improvements in the overhaul process can be attributed to a number of factors. With no one really in control of the overhaul process, solutions unpopular with any one faction will always be subject to veto. At times, when solutions to overhaul problems are attempted, a deliberate checking of

those initiatives is made by those who perceive the attempted solutions as compounding the problem. As will be shown, the growth and new work issue is a typical example of this situation.

There is a general consensus, both in the Navy and within the ship repair industry, that changes are required in the way growth and new work are managed. Significant changes have not occurred because those changes that are favored by industry are considered unfavorable by the Navy, and vice versa. What then occurs are factions working toward the common objective of overhauling a Naval vessel while negating each other's efforts at overcoming the obstacles that hinder that effort.

THE OVERHAUL OF THE USS RALEIGH

Before beginning a more detailed explanation of why such counter-productive efforts occur, it will be easier first to illustrate how such incidents occur. The example used here, specifically the recent overhaul of the USS RALEIGH (LPD-1), is presented to illustrate the background of the problems encountered with growth and new work. This brief summarization of the RALEIGH's overhaul is not intended as a critique of that overhaul or of the way those persons involved with that overhaul managed the problems that occurred. While each overhaul is unique, the problems that occured during the overhaul of the RALEIGH demonstrate some of the problems which are frequently encountered during ship

overhauls. These points are presented here to demonstrate how growth and new work problems arise and why the measurement of growth and new work is so difficult. [3]

The overhaul contract for the RALEIGH was issued by SUPSHIP Portsmouth on 13 March 1979. The SUPSHIP estimated that the RALEIGH's total overhaul, including growth and new work contract changes, would cost approximately $15.3 million. When the firm fixed price contract was awarded to Maryland Shipbuilding of Baltimore at an initial price of $15.2 million, the $15.3 million estimate for total overhaul costs quickly lost credibility. Originally scheduled for completion on 16 April 1980, the delivery date was repeatedly extended. The RALEIGH was finally able to sail from Maryland Ship on 19 December 1980, two hundred seventy-three days beyond the originally scheduled date. Growth and new work additions required 1,570 contract changes and caused the price for this overhaul to grow from the original price of $15.2 million to a total of $25.5 million.

The problems encountered during the RALEIGH's overhaul are much too extensive to address in detail here. At the risk of over-simplifying the complex circumstances that surrounded that overhaul, two significant problems can be extracted and examined in hindsight. These two factors are not considered unique to the RALEIGH's overhaul, and serve to illustrate the counter-productive efforts of those involved in the overhaul process mentioned earlier.

One of those factors deals with the selection of work items for inclusion in the basic solicitation distributed as the Invitation for Bids (IFB). Several major jobs were all identified as overhaul requirements prior to the issuance of the IFB, yet none of these items were included in that solicitation. Several items, including work on the RALEIGH's high and low pressure drains and deballast piping and work on SHIPALT 250K, a ship alteration designed to increase air conditioning, were particularly significant. The reason that was given by the type commander to the SUPSHIP for delaying the inclusion of this work was that insufficient funds were available at the beginning of the overhaul to write the work into the original solicitation. The SHIPALT, funded by the Naval Sea Systems Command (NAVSEA), was apparently delayed for the same reason. When these items were finally written into the contract, after the award had been made to Maryland Shipbuilding, the Navy paid dearly. Work on the drains cost $361,043 and required a delivery date extension of twenty-three days; the deballast piping cost $646,000 and required a ninety-eight day extension; the SHIPALT cost $623,787 and, while requiring no additional time, served to compound the other jobs by placing additional demands on the pipefitters' shop.

The second factor that stood out in the RALEIGH's overhaul involved work that was initially assigned to the ship's force for accomplishment, but was subsequently awarded to

the shipyard when it became apparent that the work exceeded the ship's force capabilities. It is difficult to measure the impact of this factor on an overhaul in terms of dollars or days' delay, but it was considered by SUPSHIP Portsmouth to be a significant factor in compounding an already difficult overhaul.

The problems encountered with the RALEIGH's overhaul go far beyond these two factors. These are mentioned primarily to present the following points. While SUPSHIPs are tasked with estimating costs and managing overhauls, the scope of a contract is, in most cases, not definitized until the day the contract is awarded. Changes are made continuously while solicitations are "on the street" as well as after bid opening. In the case of the RALEIGH, major work was deliberately excluded until after bid opening, even when it was known that those jobs had to be accomplished during the overhaul. Then, following the inclusion of that work into the contract, additional problems were encountered due to the migration of work from ship's force responsibility to shipyard responsibility. The result of problems such as these is to create cost and schedule estimates that are often tenuous at best.

These two factors alone were responsible for multi-million dollar increases in the contract and months of delay in completing the overhaul. In addition, by delaying the inclusion of these items into the contract, much of the

benefit expected from formally advertising the overhaul requirement was lost. It is something of a paradox that these extraordinarily expensive actions were accomplished in the interests of economy. The work was either not included in the original solicitation or was, in many cases, given to the ship's force to accomplish because adequate funds were not available at the time the solicitation was issued to pay for that work. When funds became available later in that fiscal year or in the following fiscal year, the contract grew a full ten million dollars. Time, coupled with the physical limitations imposed when overhauling a ship in a private yard, precluded any real competition from being effected when that additional work was awarded, allowing Maryland Shipbuilding to price contract changes, including new work requirements, as a sole source contractor.

The problems encountered during the overhaul of the RALEIGH at Maryland Shipbuilding were not necessarily surprises. The Navy was aware from the beginning that RALEIGH's overhaul could well be more than Maryland Shipbuilding could handle. Senior Navy officers and contract administration personnel met with the shipyard's key personnel, including Maryland Ship's general manager and assistant general manager, biweekly during the overhaul to discuss ongoing problems. While these meetings served to resolve many issues, they did not ensure a quality overhaul for the RALEIGH. When the ship sailed from Baltimore, all required

work had still not been completed. Five months after completing the overhaul, a contract was awarded to Norfolk Shipbuilding and Dry Dock Company to complete work on fourteen new work items that remained outstanding from the overhaul at Maryland Shipbuilding that were considered too essential to defer until the next scheduled availability. Norfolk Shipbuilding estimated the price of this work package to be approximately $162,000.

After 1,570 contract changes, ten million dollars in cost growth, two hundred seventy-three total days delay, and close supervision of the contract by senior Navy and shipyard personnel, the RALEIGH could still not obtain a quality overhaul. On the surface, the RALEIGH's situation appeared to be little more than another example of poor cost and schedule estimating by the SUPSHIP. Further examination revealed a much more complicated situation in which a contract for a complex repair effort was awarded to a contractor with limited capabilities to manage such an effort. The situation was further compounded by the Navy's efforts at controlling overhaul funds by deliberately deferring critical work, which ultimately resulted in a loss of control in managing growth and new work contract changes. The USS RALEIGH's overhaul responsibility, allegedly vested in the Supervisor of Shipbuilding, was circumvented through actions by the type commander, the Naval Sea Systems Command, the ship's force, and the shipyard. The ship's overhaul

schedule, promulgated by the Chief of Naval Operations, became basically meaningless as the overhaul dragged on months beyond the scheduled completion date.

It is this overlapping of authority and interests, coupled with the legal restraints that are imposed when dealing with public funds, that makes any effort to solve the problems of growth and new work the challenge that it is. An understanding of these relationships of authority, responsibility, and accountability is required before the problem can be approached.

III. THE SHIP OVERHAUL ENVIRONMENT: CONFLICT AND THE RESOLUTION OF CONFLICT

The events that occurred during the overhaul of the USS RALEIGH illustrate how responsibility for the key concerns of cost, schedule, and quality is shared during overhauls, as well as how unequal attention is given to those considerations as overhauls progress. This division of responsibility and authority makes the repair and overhaul of ships a problem unlike any other that confronts the contracting officer. It is an environment that often places the contracting officer in the position of being an arbitrator of disputes between not only the government and the contractor, but often among factions within the Navy as well. This chapter will discuss the environment in which the key members within the Navy and within the ship repair industry must function to resolve the inevitable conflicts and disputes that occur during overhauls.

THE NAVY VERSUS THE SHIP REPAIR INDUSTRY

Disputes between the Navy and the shipbuilding industry have become well publicized media events in recent years. While much has been said about a new spirit of cooperation between government and industry, recent speeches by leaders in both the Navy and in the shipbuilding industry seem to indicate that this new era is more a feeling of the the way

things should be rather than the way they are. There are many indications that old attitudes of conflict and confrontation have changed little.

Edward Campbell, the president and chief executive officer of Newport News Shipbuilding and Dry Dock Company, in a presentation to the Hampton Roads Chapter of the National Contract Management Association in January 1981, opened a discussion on doing business with the Navy by listing the advantages of having the Navy as the prime customer of Newport News Shipbuilding. He then proceeded to discuss the Navy's "redundant audits, claims certification, and profit holdbacks, as well as continuing attempts to revise contract terms and conditions to pass on an undue amount of risk to the contractor." He chastised "some of the people in Washington" for their "attempts to force on us new contract clauses which make it all but impossible for the shipbuilder to recover cost increases caused by the Navy." Addressing growth and new work changes, he stated, "We don't believe we should be forced to release the Navy from its responsibility to pay for its own mistakes just because those mistakes don't surface within a prescribed time." [4]

In a speech delivered before the National Press Club in August 1981, Secretary of the Navy John Lehman acknowledged some problems with government contracts, but stated, "By a wide margin most of our shipbuilding programs are on cost, and on schedule, and are being very well managed." He then

proceeded to discuss the "mistakes, the negligence, the poor workmanship, [and] the inadequate management" of one of the Navy's most important shipbuilders, General Dynamics Electric Boat Division. [5]

Public debate of the government's problems can, in one sense, be considered a fundamental part of a democratic system. An occasional poignant comment delivered by an industry or government leader must be taken within the context of the politics of the moment and the history of past events. Yet the relationship between the Navy and the shipyards has transcended the level of a public discussion of alternatives. In all too many transactions, conflict between the Navy and the shipyards has become the way that day-to-day business is conducted.

THE SHIP REPAIR INDUSTRY

In a study of the shipbuilding industry conducted by the firm of Edward M. Kaitz and Associates for the Office of Naval Research, the following point was made:

> Few businessmen like to be reminded of their dependency on one customer not only for the bulk of their business, but also for access to the funding not otherwise available to them from the capital markets because of the circularity of their capital and low profits. Except for the most patient of business executives, the situation is fraught with conflict. [6:26]

The shipbuilding industry today certainly fits within Kaitz's definition of dependency upon one customer. The Washington Post described it as an industry that appeared

"destined to become a virtual appendage of the military." The Shipbuilding Council's own statistics paint an equally dim picture. Two-thirds of the nation's 99,000 shipyard production workers are presently employed on Navy projects. For every one dollar in commercial work, private shipyards receive nine dollars for Navy work. M. Lee Rice, the president of the Ogden Corporation's shipbuilding subsidiary, stated, "The decline in commercial orders leaves us creatures of the Navy." [7]

While the statistics and quotes cited here were originally written specifically about the shipbuilding industry, there are obviously many correlations that can be drawn between the shipbuilding and the ship repair industries. With labor costs in these industries totalling over half of all production costs, both can be considered labor intensive. [6:5] These industries have been severely affected by foreign competition, and both have lost most major commercial business to shipyards overseas. [8] This lack of business and resulting excess capacity have created intense competition, and both industries have become dependent on the Navy for obtaining the work that spells the difference between either financial survival or corporate demise. Both industries are large employers, and are considered critical to the nation's defense mobilization requirements. As a result, the shipbuilding and the ship repair industries are politically sensitive.

There are, however, some marked differences between the two industries, not the least of which is their difference in size. While shipyards capable of building vessels are equally capable of repairing those vessels, businesses that are exclusively ship repair activities are typically much smaller, and are lacking in the expensive and sophisticated technology that exists in the larger shipyards. There are almost two hundred contractors holding master ship repair (MSR) contracts, but only eleven have the facilities that are required to build ships for the Navy. [9]

While some ship repair contractors have made extensive investments in facilities, the repair of Naval vessels remains a labor intensive endeavor that is limited in its ability to achieve efficiencies through automation. As a result, there are relatively few barriers to entry into the ship repair business. [6:7] However, once new contractors have entered the field, there are political pressures that work to keep those contractors in business by ensuring that entry into government contract work remains accessible. As a result, the purging of inefficient businesses that would be expected within a competitive environment during times of excess capacity has been restricted by a government that is interested in both keeping workers and voters employed while maintaining the industrial base necessary to support the Navy.

These small businesses have responded to this environment by showing an almost remarkable ability to survive during austere times. In addition to government contract work that has kept them solvent, the ability of these contractors to remain in business can largely be attributed to the flexibility of the industry's labor force. In an environment as labor intensive as the ship repair industry, the labor force has become the single most critical resource these contractors must manage. An idle labor force constitutes a luxury that even the largest shipyards cannot afford. As a result, the labor force, including both blue collar and middle management personnel, is continually in flux, as each worker looks ahead to the next job with the shipyard that has been successful in winning ship repair contract work. By keeping both capital investments and the size of the payroll as small as possible, the ship repair contractor has been able to remain in business.

THE NAVY'S CONFLICT OF GOALS

It is within this range of contractor talent, from the most sophisticated and technologically capable shipbuilders to these borderline survivors, that the Navy must deal on a daily basis for accomplishing its ship repair work. It would certainly be in the interests of the ship repair industry if the Navy were organized in a manner that would allow it to effectively cope with this range of contractors. This goal could be accomplished--if this were the single, or

even the most important, goal to be achieved. Instead, the situation facing the Navy requires an organization that must adapt to a complex mix of goals and a continual revision of priorities.

An example of the Navy's continuing contradiction of goals can be seen within the overhaul of the USS RALEIGH. Within that overhaul, budget restraints initially dictated the scope of the overhaul contract that was signed. Work requirements midway through contract performance inflated both overhaul costs and schedules beyond original plans. Finally, schedule requirements demanded that the ship be removed from the contractor's shipyard before all contracted work had been completed. While all these events shaped the eventual outcome of the overhaul, none of the three variables of cost, schedule, or work requirements were ever established as the single most important overhaul priority to be met.

This single view of the RALEIGH's overhaul can be expanded to the Navy's approach to overhaul management in general. Is the object of the ship repair mission to maximize dollars allocated to the ship repair account in any one fiscal year, or to use taxpayers' dollars efficiently in general? Is the purpose of ship overhauls to extend the useful lives of ships, or to ensure that the Navy's operational commitments can be met? Should the Navy work to provide jobs for American taxpayers, or is the primary

concern that some level of expertise be maintained to protect the nation's ability to mobilize in times of war? While it would be easy to say that the purpose for the ship repair effort is to repair ships, it quickly becomes apparent that, to some extent, all of these objectives are goals that must be included in the way the Navy manages its overhaul effort. It is necessary for many interests to be included and protected, even when those interests occasionally conflict.

The Navy's organizational structure must be able to respond to both routine and urgent ship repair requirements. It must be able to accommodate national requirements for maintaining an industrial ship repair capability and it must consider local requirements when awarding contracts on a regional basis, all while attempting to ensure that Naval shipyard capacity is neither grossly under-utilized nor over-extended. It must be able to forecast fleet requirements with a view toward future unknown missions while ensuring that those yet-to-be-built ships can be economically constructed, effectively operated, and efficiently repaired. The Navy must be capable of preparing and defending budget requests years in advance of requirements. When funds are appropriated, the Navy must be able to channel a portion of those funds to the ships requiring repairs and overhauls through the contractors that must perform those repairs, and must do so before those funds expire. Finally,

it must perform these tasks in a manner that will remain within the guidelines prescribed by law and regulation while attempting to minimize litigation from contractors' protests and disputes. Shipyards are organized and structured to repair ships. The Navy is not.

THE NAVY'S ORGANIZATIONAL STRUCTURE FOR REPAIRING SHIPS

The system is unquestionably cumbersome and bureaucratically complex, and the cry is frequently heard that "something should be done." Beyond this point, it becomes unclear who is responsible for taking such action and what action, if any, can be taken. In reviewing the overhaul process, it becomes even more difficult to identify any step in the lengthy process that can be extracted and deleted while simultaneously improving that process.

The first step in analyzing the ability to change begins with understanding how the process now works. While there are any number of ways to count the key members within the Navy that affect the overhaul process in some way, the principal organizational entities within the Navy responsible for managing overhauls is limited to only three--the Chief of Naval Operations (the CNO), the Naval Sea Systems Command (NAVSEA), and the type commanders. Within these organizations are three subordinate organizations involved with ship overhauls on a more mundane level. These are the Supervisors of Shipbuilding, Conversion, and Repair (the SUPSHIPs), who report to NAVSEA; Planning and Estimating for Repairs

and Alterations (the PERAs), who also report to NAVSEA; and the commanding officers of the ships undergoing overhaul, who report to their type commanders.

While individuals within these organizations are collectively responsible for managing ship overhauls conducted in private shipyards, only one--the Chief of Naval Operations--can claim full responsibility and accountability for that effort. Since he also is the one most distant from the problems facing ships in overhaul, the Office of the Chief of Naval Operations (OPNAV) relies almost exclusively on input provided from NAVSEA and the type commanders, through the chain of command, to evaluate ship overhaul problems.

The CNO's primary mission is not to analyze and solve administrative problems arising during overhauls, but to maintain the operational readiness of the fleet. It is in this capacity that the CNO promulgates ship overhaul schedules for all ships of the fleet. The schedule, updated quarterly, uses input from both NAVSEA and the type commanders. The consolidated report specifies which ships can be relieved of their operational commitments, allowing them to be overhauled, while ensuring force requirements can still be met with remaining assets. The directive provides a general overhaul schedule five years hence (the "notional schedule"), with specific action normally initiated about two years prior to each scheduled overhaul commencement.

Outwardly, the OPNAV schedule seems to be no more than

another directive for tentatively planning overhauls. When considering the interrelationship of factors that are required to promulgate this schedule, the magnitude of this task can be more readily appreciated. The schedule must not only forecast operational commitments for years to come but also must attempt to estimate repair requirements for dozens of vessels ranging in age from newly commissioned ships to ships that are decades old, and then extrapolate from those estimates both the time and cost required for repairs.

Obviously, the schedule produced can be no more valid than the data that is used in making such forecasts. Providing the technical and the management data necessary for meeting the Navy's ship construction and repair requirements is a principal function of the Naval Sea Systems Command. Through the consolidation of many organizations once tasked with specialized repair, construction, and operational concerns, NAVSEA has evolved into the Navy's largest systems command. Included within that organization is the central responsibility for contracting for ships and ship systems.

The purpose for this consolidation of many organizational entities into one command responsible for all ship systems was to streamline the bureaucracy by bringing together groups that shared a common concern in managing the Navy's ships and ship systems. This was the goal, but it is difficult to measure how well it has been achieved. One

example of problems the consolidation has caused can be seen in the way NAVSEA manages their ship overhaul duties. While NAVSEA holds the responsibility for technical as well as contractual matters pertaining to ship overhauls, this concentration of authority is subsequently diluted by dispersion of that responsibility and authority throughout the organization as well as among subsidiary field organizations.

Assigned as parts of NAVSEA are two such field organizations, the SUPSHIPs and the PERAs. These organizations are tasked with the responsibility for planning and managing ship overhauls, but they depend upon the central organization of NAVSEA for policy and procedural guidance. While their missions are closely related, the SUPSHIPs and the PERAs are organizationally segregated, ostensibly for purposes of concentrating specialized expertise into areas which ultimately will result in greater continuity of procedures and more efficient operations.

Of the two organizations, the PERAs are the least rigidly structured. Originally conceived in the early 1970's as an organization designed to provide NAVSEA with technical evaluative information pertaining to ship systems, the PERAs have since evolved into something of a "catch-all" organization that provides a variety of test, inspection, and evaluation functions for the type commanders as well as NAVSEA. Operating from five different field offices which have been

organized by ship types, the PERAs are directly involved with ship overhauls by being assigned responsibility for advanced planning for overhauls.

Planning for ship overhauls is the first step in the process that will ultimately determine the scope of the contract that will be awarded for the overhaul. In an effort to make the work package as accurate and complete as possible, the PERAs initiate a fairly rigorous process that includes the physical inspection of the ships to be overhauled, the validation of equipment on board those ships, and the ordering of long-lead-time parts and materials. To provide as complete an overhaul work package as possible, the PERAs use contracted assistance as well as technical representatives from SUPSHIPs, Naval shipyards, and type commanders's staffs when conducting the "ship checks" that will eventually determine the work to be performed. Data collected eventually becomes the baseline work requirements packages for overhauls. [10]

The work packages prepared by the PERAs are subject to a number of reviews before being delivered to the SUPSHIPs for development of the solicitation. Each repair, overhaul, modernization, or alteration job must be reviewed for technical feasibility and funding responsibility. Once this review procedure is completed, the package is delivered to the responsible SUPSHIP for developing cost estimates for the overhaul.

The cost estimating process within the SUPSHIP is normally accomplished by individuals who have received the majority of their training through experience in working with ship systems as mechanics or technicians. Estimates are made by breaking requirements down into basic systems, which allows costs for direct materials and direct labor to be more easily determined. Estimates are also made for the overhead, general and administrative expenses, and profit that contractors are expected to include in their bid proposals. However, due to the dramatic differences in size among contractors bidding on ship repair work, cost estimates for other than direct materials and direct labor are normally "ballpark" estimates at best.

Approximately six months prior to the commencement of the overhaul a work definition conference is held. [11] Up until this point, the work that has been screened by the PERA and the SUPSHIP has included virtually every job that was either required or desired by NAVSEA, the type commander, or the ship. Once the SUPSHIP has completed the price estimations for the work requirements, it normally becomes apparent that limited funds will provide the main constraint in restricting the scope of the overhaul contract to be awarded. The purpose for the work definition conference is to reduce the work package to those items that will be either included in the solicitation for bids or assigned to the ship's force for performance. The items remaining,

considered as being too expensive or too complex for performance during the overhaul, are either deleted entirely or modified in such a manner that they can be included in one of the first two categories.

The work package that results from the work definition conference is supposed to be the final package that will serve as the statement of work in the invitation for bids. Only work that is screened by the type commander or NAVSEA and is labelled as an emergent requirement is to be forwaded for processing as an amendment to the work package and contract solicitation.

The role of the type commander in the overhaul process is one of indirect control of the overhaul through direct control of funds that are allocated to the overhaul. Since the type commander is responsible for both the ship's being overhauled as well as the funds required for the overhaul, he subsequently has the authority to approve or disapprove most of the work that is included in the overhaul work package.

While the type commanders' authority is substantial, it is not absolute. NAVSEA, as the organization responsible for approving all work that modifies or alters any design or configuration of the ship, has a great deal of control in authorizing and directing any substantive changes to ship systems. When changes are made that affect the designed operational or safety characteristics of systems, NAVSEA

normally will initiate the change and provide both the technical information as well as the funding required to effect those changes.

It is the responsibility of the SUPSHIPs to coordinate the requirements that flow from NAVSEA, the type commanders, and the ships into contracts and then to administer those contracts. While the SUPSHIPs are responsible neither for originating the requirements that are included in overhaul contracts nor for changing requirements once those contracts are awarded, the fact that it is the SUPSHIPs who must estimate overhaul costs and then contract for all such work places them in the position of assuming responsibility for contractual problems that result.

The process discussed so far has briefly touched on some of the major responsibilities of NAVSEA, the SUPSHIPs, the PERAs, and the type commanders. Frequently excluded from discussions of the overhaul process is the role of the ships themselves and the officers who command those ships. The responsibility of ship commanding officers during overhauls is a dichotomy. The commanding officers have virtually no authority over ship overhaul funds or schedules. They are not authorized to include new work in overhaul contracts, nor may they direct changes to those contracts. Yet while their authority is severely limited, they are still considered responsible for their ships.

Commanding officers, who may have very limited experience in overhauling ships and who normally have no formal training in contract administration, find themselves in the position of being able to exercise significant control over how overhaul contracts are administered. This authority is never expressed in any transfer of the administrative contracting officer's authority, but is derived from the fact that the ship must function as a partner with the shipyard to coordinate the accomplishment of work. While the shipyard and the ship's force work from two different lists of jobs to be performed, the work is frequently interrelated. Gauges and meters must be calibrated by the ship's force before fuel tanks overhauled by the shipyard can be fully closed out. Bulkheads to be painted by the ship's force must be first installed by the shipyard. Work that is not performed to the satisfaction of the ship's commanding officer must be reinspected, and possibly reworked, regardless of how contract statements of work may be written. The potential for conflicts between shipyards and ship's crews is enormous, and conflicts frequently occur.

One major reason it is difficult to resolve conflicts that occur during ship overhauls is that it is often difficult to identify the history leading up to the conflict. Occasionally, trivial problems and objections are raised by both contractors and the government. Occasionally, issues that are ignored as trivial by both sides have

repercussions months later when major equipment must be pulled to perform inspections that were omitted or to replace valves that were overlooked. The questions that arise are often very difficult to answer. Who was responsible for the oversight? Who should pay for the problems that occur? Who should pay for the delay, disruption, and acceleration that resulted? Should the costs and responsibility be shared, and if so, in what proportions?

It is here that coping with the Navy's bureaucracy becomes especially difficult. If the Naval Sea Systems Command authorized a change that was directed and funded by the type commander, a change that was researched and documented by the PERA, performed by the contractor, and inspected by the SUPSHIP, who is responsible for subsequent problems? Given the Navy's organization for managing overhauls, the answer is that rarely is anyone in a position to assume full responsibility for specifying all actions required to correct problems that occur, and then to pay for those actions.

Within the shipbuilding and ship repair environment that exists today, conflict will remain as a part of the overhaul process. The result is that the contracting officer's role often becomes one of conflict resolution rather than one of conflict avoidance. Unfortunately, the structure that exists between the Navy and industry is poorly designed to address and resolve conflict.

Growth and new work is an issue of conflict. It is within this organizational structure that problems which arise during overhauls must be solved. As mentioned earlier, the federal government, and the Navy in particular, are structured to deal with a range of problems that far exceed the direct concerns of ship overhauls and repairs. Attempting to resolve conflicting goals and contradictory objectives within this structure has been one significant factor that has caused the issue of growth and new work to become a political as well as a managerial issue.

IV. CONTRACTING FOR SHIP OVERHAULS

Criticism of the way the government manages its affairs is often followed by a statement to the effect that the government would run much more efficiently if it could only employ the sound business practices proven to be effective in industry. In reviewing the way private shipping lines repair their ships, it is apparent that the way the government and industry effect ship repairs are markedly different, and that many ship overhaul and repair problems are unique to government contract work.

When repairs to a privately owned vessel are required, the owners select several contractors considered capable of performing the work. Those contractors inspect the ship to be repaired and prepare estimates. On the basis of those estimates, a contract is awarded and the work is accomplished. When problems occur during the repair work, a technically capable individual representing the vessel's owners makes a decision, normally at the scene, regarding the way the contractor should proceed. When the work is completed, the contractor is paid his costs and profit. If the work is not completed satisfactorily, or is not completed on schedule, or if the price is too high, the vessel's owners will choose a different contractor when the next requirement comes due.

The Navy's procedures for selecting contractors and awarding and administering contracts for ship repair work is quite different. Requirements that are known years in advance are often awarded only weeks, and sometimes days, before the overhauls begin. Contractors with records of poor performance are rarely excluded from bidding for additional contract work. Contracts are awarded on the basis of contractor replies to the Navy's invitation for bids, with some consideration given to the complexity of the work involved and the contractor's ability to perform. Contractors winning the award may never have seen the ships that are to be overhauled. Changes to contracted work are frequently required but are normally accomplished only after written reports are prepared, funds are allocated, and numerous approvals are received. When the repairs are completed, contractors are not always reimbursed in a timely manner for work that is performed and for costs that are incurred, resulting in time-consuming disputes and lengthy claims processing.

The reason the Navy gives for conducting its business in a manner that is so disparate from its commercial counterpart is because the Navy must comply with federal laws and regulations. This chapter will review the overhaul requirements themselves and will discuss the regulatory environment in which those contracts are written.

FINANCIAL CONTROL AND THE SHIP OVERHAUL PROCESS

The regulations confronting government contracting officials are, to say the least, extensive. Central to any discussion concerning regulations surrounding the overhaul process is the role of the Congress, which is largely responsible for most regulations affecting government contract work. The rationale behind most Congressionally mandated regulations is, for the most part, fairly straightforward. The Congress has attempted to structure legislation in a manner that will contribute to the achievement of specified socio-ecomomic goals and objectives while ensuring tax dollars are spent effectively. One of the basic financial control procedures used by the Congress, the appropriation of funds on a fiscal year basis, is also at the base of the growth and new work controversy.

Authorizing the expenditure of funds at the beginning of each fiscal year provides the Congress with the means to control the continuation of many federal programs. Funds provided for ship conversion and repair are included in this process. In the case of ship overhauls, funds allocated to this account must be obligated, through the awarding of contracts, in the same year the funds are appropriated. Once the fiscal year has ended, funds appropriated for that year may no longer be obligated for new requirements. However, those funds may be used to pay for goods and services for which contracts have already been made. This limitation on

the expenditure of funds is central to the issue of growth and new work.

The way this requirement affects ship overhauls can best be illustrated through the use of an example. Assume a contract was made for the replacement of a ship's turbine in September 1981 (fiscal year 1981), and that work commenced that same fiscal year. If the work was not completed until October 1981 (fiscal year 1982), payment for those repairs may still be made using fiscal year 1981 funds, since those were the funds originally cited in the contract. If unexpected complications occurred during those repairs and a higher price for the work was negotiated in fiscal year 1982, payment could still legally be made in fiscal year 1982 using FY81 funds. This is an example of using lapsed funds to pay for growth work.

An example of new work can be made by expanding this illustration. Assume, during repairs to the turbine, it is discovered that an oil pump is also found to be defective. The circumstances then become quite different. Since the contracted repairs did not include repair or replacement of the oil pump, a new procurement is now involved. Federal law states that new procurements may not cite funds for a fiscal year that has expired. If the defective pump is discovered in fiscal year 1982, FY81 funds that are being used to repair the turbine may not be legally used to repair the oil pump.

What then occurs is that the Navy, or more specifically the SUPSHIP, is responsible for managing two different accounts for the type commander while attempting to repair one ship. The situation becomes even more complicated if the overhaul is drawn out through three fiscal years. When this situation is overlayed with related work that is being funded by NAVSEA as ship alterations, (funds which are subject to the same type of restrictions), the allocation of funds can quickly deteriorate into a fairly arbitrary process. Not surprisingly, Naval Audit Service reports concerning the management of these funds are replete with examples of such problems.

The purpose for such regulations is apparent. In the absence of such regulations, programs that Congress chooses to cancel by discontinuing the allocation of current fiscal year funds could be continued indefinitely. If the agency holding unobligated funds from prior fiscal years chose to continue funding programs through the expenditure of those funds, this Congressional control mechanism would be all but eliminated.

Secondly, to ensure prices paid for new procurements are fair and reasonable, Congress has directed that all new requirements be formally advertised and competed to the maximum extent practical. In the absence of such a directive, an agency could award a contract for one item and, through the use of changes to that contract, buy goods or services

that are completely outside the scope of the original contract.

DEFINING THE SCOPE OF OVERHAUL CONTRACTS

Controlling funds through fiscal year restrictions is not a significant problem in the great majority of government contracts. At times, contracting officers are faced with the option of either directing a change to a contract that may be questionable, such as a change that may be outside the scope of a contract, or initiating a new procurement. Most contracting officers will choose the less controversial option and direct that a new procurement be initiated.

The situation facing the SUPSHIP, however, is not as clearly defined. Ships undergoing extensive overhauls are normally so time constrained that it is impractical to competitively bid new requirements discovered during the overhauls. If repairs are not accomplished at the time problems are found, it is usually difficult, if not impossible, to effect repairs later. When it is determined that repairs are required, the contracting officer normally directs the contractor holding the overhaul contract to accomplish those repairs. It is impractical to compete a new requirement and expect several contractors to work on different, and possibly related, equipment in the same ship at the same time. Neither time nor good managment control procedures can allow such strict compliance with the

Congressionally mandated preference for competition. Any savings obtained from competing such requirements would be exceeded by costs incurred from schedule delays, inefficiencies in controlling the work, and contractors' claims.

Still there remains a concern regarding whether the growth experienced within ship overhaul contracts can be considered within the scope of those contracts. Overhaul contract changes, which are normally unilateral changes directed by contracting officers, are frequently the source of claims and disputes. Rarely, however, are the unilateral changes directed by contracting officers challenged by contractors as being "cardinal changes," or changes outside the scope of the overhaul contracts.

There are at least two reasons for this. First, given the excess capacity that presently exists within the ship repair industry, contract changes provide a significant portion of shipyard business, which in turn translates into shipyard profits. It would make little sense for a ship repair contractor to protest a sole source award to his shipyard when such work is essential to his survival. The second reason is simply because mosts protests involving claims that contracting officers exceeded their authority by directing cardinal changes have been unsuccessful. Such claims often hinge on whether or not the contractor expected the contract to be modified as directed. Given the past history of overhaul contracts, it would be difficult for a

contractor to claim that he entered into an overhaul contract unaware that major changes to the contract would occur.

Similar claims outside the ship repair industry have established precedents that would discourage most contractors from pursuing this argument. In one case involving changes to a contract for the new construction of a submarine at General Dynamics's Electric Boat Division, the Court of Claims held that major design changes to the submarine, including changes involving the lengthening of the hull, were within the scope of the contract. The Court stated that when an item as complex as a submarine is being constructed, the ship "normally undergoes changes as construction progresses and superior solutions are developed to continuing problems." The Court refused to confine itself "to comparing the number of parts changed and unchanged." The major argument the Court offered in finding against General Dynamics was that General Dynamics could not have reasonably counted on completing the construction of the submarine without disruption by change orders. [12]

The principles established in the General Dynamics case were reiterated in a recent protest to the General Accounting Office, in which the Comptroller General stated:

> The [General Accounting Office] has recognized that noncompetitive awards may be made where the minimum needs of the Government can be satisfied only by items or services which are unique, where time is of the essence and only one known source can meet the Government's needs within the required time frame, where data is unavailable for

competitive procurement, or where only a single source can provide an item which must be compatible and interchangeable with existing equipment. [13]

EVALUATING GROWTH AND NEW WORK

While these and similar cases provide the precedents necessary to allow questions involving the scope of overhaul contracts to be sucessfully skirted, they do not resolve the issue regarding the proper allocation of growth and new work funds. To the contractor repairing the ship, the account that is cited for payment of overhaul work is of little consequence. But compounding the contractor's situation is another view of ship overhauls that the contractor seldom sees. There is a perception, well above the waterfront level of management, that the quality of overhaul management can be measured by comparing the dollars that are contributed to growth work to the dollars that are contributed to new work.

This argument holds that expenditures for new work indicate poor overhaul planning and management, since any work that was really required would have been properly included in the solicitation and contract. Additionally, the argument states that excessive expenditures for growth work are probably the fault of the contractor, since the contractor should have been able to evaluate properly jobs cited in the solicitation prior to bidding for the work. Likewise, new work requirements are probably caused by poor planning on

the part of the Navy, since this is work that should have been included in the contract from the beginning.

It was this philosophy in evaluating overhauls that prompted a letter in April 1981 from Stuart Adamson, the Vice President of the Shipbuilders Council of America, to the Contract Administration Division of the Naval Sea Systems Command. In that letter, Mr. Adamson protested the Navy's "misleading" figures used in evaluating overhauls, and the lack of any "clearly established rule for identifying actually what is 'new work.'" [14]

It was Mr. Adamson's understanding, based on the Navy's criticism of overhaul work accomplished in private shipyards, that because most changes to contracts were being funded with prior fiscal year funds, the Navy felt that it was paying in both time and dollars for work that should have been apparent to contractors at the time of award. The unspoken criticism was that private contractors were "buying" overhaul contracts, knowing that they could "get well" on changes.

Mr. Adamson held that if the Navy properly recognized new work, it would be apparent that delays and cost overruns were the result of the Navy's making major new work changes to contracts after the contracts were awarded. In essence, the issue at question involved the effectiveness of using the fiscal distinction between growth funds and new work

funds as a tool for measuring the quality of overhaul management.

The distinction established by Congress for segregating fiscal year funds was established so that Congress could exercise some control over those funds. Using this distinction as a tool to evaluate overhauls might have some value, but only if the Navy consistently makes the distinction between growth and new work when additional overhaul funds are required. However, there is presently no consistent method for selecting which funds to use, nor is there a consensus regarding who is responsible for making the determination concerning which funds to use. As the Navy presently manages these funds, there is a great deal of discretion at the SUPSHIP and type commander level regarding how growth and new work are funded. Examples of such inconsistencies can be found in reviewing procedures followed by three different SUPSHIPs.

In a March 1981 audit of the Supervisor of Shipbuilding at Long Beach, California, the Naval Audit Service found that SUPSHIP Long Beach used funds from an expired appropriation for work outside the scope of the original work specifications rather than funds current at the time the modifications to the contracts were issued. The Naval Audit Service claimed that they found instances in which SUPSHIP Long Beach funded new work using growth funds. This action

is an apparent violation of Section 3678 of 31 U.S. Code 628, which involves the improper used of expired funds.

The SUPSHIP replied by concurring with the facts as found by the Naval Audit Service, but the SUPSHIP did not state that corrective action would be taken. SUPSHIP Long Beach was of the opinion that the type commander and the fleet commander were authorized to cite funds for directed work as they saw fit. In reply to this argument, the Naval Audit Service stated:

> Direction from the customer cannot be seen as a reason, since SUPSHIP is responsible for seeing that public funds are spent in accordance with the law. [1:16]

These procedures can be contrasted to procedures followed by the Supervisor of Shipbuilding at San Francisco, who recognizes that the growth or new work determination is a SUPSHIP function. At SUPSHIP San Francisco, the determination is made by officers assigned to the SUPSHIP as availability managers. Written guidance is provided in the form of a procedural memorandum signed by the officer in charge of the availability managers, a procedure that was subsequently incorporated in a SUPSHIP instruction. [15]

The procedures followed by the Supervisor of Shipbuilding at Portsmouth, Virginia, were found to be different from either San Francisco or Long Beach. Guidance is also promulgated in a SUPSHIP instruction, but the growth or new work determination is made by the administrative contracting officer rather that by technical personnel. In addition,

the SUPSHIP instruction sets forth definitions to be used in distinguishing between growth and new work, as follows:

> Growth Work. Work that is closely and directly associated with the equipment component and system specified in the existing job order; does not materially alter the character or expand the job order to include additional work to any degree; and meets at least one of the following requirements:
>
> (1) Additional work required resulting from reports required in the original specifications.
>
> (2) Additional work required to complete the repairs of a specific equipment component or structural member in an original specification.
>
> (3) Additional work required to repair a specific equipment component or ship's structure so that all tests prescribed in the existing job order may be conducted.
>
> (4) Items written for clarification purposes.
>
> New Work. Work not relating to the original job order specifications which increases the scope of the job order or changes the scope of the job order. An increase in quantity to be repaired, WHICH EXCEEDS THAT WHICH WAS ORIGINALLY APPROVED BY TYCOM [emphasis theirs], is an example of new work. [16]

One significant procedural problem in attempting to gain consistency among SUPSHIPs regarding the growth and new work determination involves the apparent lack of any firm guidance from NAVSEA regarding how the determination should be made. Despite frequent reference to the terms, the Ship Repair Manual is silent regarding definitions. The only reference cited by both the Naval Audit Service and Supervisors of Shipbuilding regarding policy guidance from NAVSEA consists of a single letter issued by NAVSEA's SUPSHIP Management Division (Code 074) in December 1978. The letter provided a listing of seven categories for growth and five

categories for new work, with appropriate codes to be used for completing overhaul reports. The letter defined growth and new work as follows:

> Growth--Any change to a SARP [the overhaul requirements package] Work Item (increase or decrease) that remains within the scope of the work authorized by the TYCOM [type commander] after issuance of the last supplemental bid package (normally award date for private sector overhauls) shall be considered growth.
>
> New Work--Any work beyond the scope authorized for the industrial activity by the TYCOM after issuance of last supplemental bid package (normally award date for private sector overhauls) would be considered new work.

The letter did not include a definition for the term "scope," nor were fiscal requirements or the responsibilities of the type commanders addressed.

In addition to inconsistent procedures used by the SUPSHIPs, a second problem arises when attempting to use the dollars spent for growth and the dollars spent for new work to measure the quality of overhaul management. The distinction between growth and new work is only relevent when overhauls lapse fiscal years. All changes that occur in the same fiscal year in which the contract is awarded are paid for with "growth" funds, regardless of whether the change is unquestionably "new work" or not. The NAVSEA letter attempted to make this distinction through the coding of overhaul reports, but the distinction remains irrevocably tied to the financial issue.

COST CONTRACTS AND SHIP OVERHAULS

While better rules for evaluating growth and new work may contribute to a standardization of procedures among SUPSHIPs, the problem of uncontrolled growth and new work in ship overhaul contracts will be helped little by better definitions alone. Cost overruns create the appearance of waste and mismanagement of public funds. This impression is compounded when the contracts involved are firm fixed price contracts awarded on the basis of formal advertising. When final prices paid exceed prices cited in the basic contract by twenty-five to fifty percent or more, the contractor has no incentive to control contract costs, since losses will normally be covered through contract changes. In other words, the basic concern that contractors can "buy in" on contracts and "get well" on changes is a valid concern that is not precluded by the use of formal advertising for ship overhaul contracts.

There is no single way to contract for the government's requirements that is not without drawbacks, and formal advertising is no exception. While optimal contract types for use in ship construction have been extensively studied, contracts for ship repair and overhaul work, accomplished under master ship repair contracts, have traditionally been formally advertised.

The use of formal advertising and firm fixed price contracts has historically proven to be an effective combi-

nation for contracting for the government's requirements, providing the essential ingredients for using this method of procurement exists. The conditions for using formal advertising require an environment in which genuine competition exists; the requirements can be adequately defined to allow all competitors to be able to understand fully those requirements; and adequate time exists for the government to prepare solicitations, for contractors to prepare proposals in reply to those solicitations, and for the government to evaluate the proposals and the ability of the low bidder to perform. [17]

Given the competitive environment that exists among shipyards, adequate competition does exist for most overhaul requirements. Likewise, given the CNO's long range schedule for overhauls, there also seems to be adequate time to allow the use of formal advertising. It is the third requirement, the need to define the overhaul work package completely and in detail, that has proven to be a the most difficult obstacle in contracting for overhauls.

THE IMPACT OF PERSONNEL CONSIDERATIONS

The previous chapter discusses the role of the PERAs in developing overhaul work packages. There remains, however, another problem built into the process that must be overcome before work requirements can be documented in the detail required for using formal advertising. This problem

involves the ships themselves and the crews that man those ships.

As mentioned in the previous chapter, ship overhaul work has become highly competitive in recent years. In addition to the loss of much commercial work to shipyards overseas, Naval ship overhaul requirements have declined as the number of ships in the fleet was reduced following the war in Vietnam. In spite of this reduction in the number of ships, the Navy has attempted to continue to meet its obligations at sea through greater dependence on technology and by keeping its remaining ships in an operational status for longer periods.

The effect of these policies have been felt by the private shipyards as fewer ships become available for overhaul. Of those ships that are being overhauled, contractors are finding that shipboard systems are becoming increasingly complex and sophisticated, and that equipment on board those ships has been operated for longer periods between overhauls.

Compounding this situation are the often discussed problems created by the all-volunteer Navy, problems that directly impact ship maintenance and overhaul contracts. The corps of Navy petty officers trained to maintain those complex ship systems are continually confronted with the choice of either spending long periods at sea or accepting better paying jobs with industry. In an effort to stem the flow of

experienced personnel from the Navy, personnel retention has become one of the Navy's most important priorities. In addition to the direct effect the loss of skilled personnel has had on the repair and maintenance of ship systems, this situation has affected ship overhauls in three significant ways.

First, in an effort to encourage retention, the Navy attempts to allow Navy personnel the opportunity to be located near homeports of their choice. This often causes ships' crews to undergo major changes prior to commencement of overhauls. With each major change in the crew comes a major change in perceived overhaul requirements. Problems the departing crew may have been willing to ignore now become problems that must be solved. These preferences of the crew often direct the way overhaul work is approached.

One common way the new crew affects the overhaul is through a renewed attention to overhaul planning. Planning that should have been accomplished by the crew twelve to eighteen months earlier but was deferred due to operational priorities now becomes the ship's most important concern. The new crews, on board for the overhaul and the post-overhaul deployment, actively work to rectify the earlier crews' indifference by pressing for changes to the overhaul contract.

Secondly, many ships have spent long months at sea prior to the commencement of their overhauls and normally face

long deployments following the completion of their overhauls. As a result, an effort is made to allow overhauls to be conducted as much like shore duty as possible. Commanding officers frequently authorize a four-day work week during overhauls. Since ships are often already undermanned during overhauls, the impact of fewer Navy personnel available to accomplish work assigned to ships' forces is felt when shipyards attempt to coordinate jobs to accomplish work called for in the contracts.

The third effect of the personnel retention effort affects the awarding of contracts themselves. The NAVSEA Repair Manual, the principal NAVSEA directive governing ship overhauls, states that contracts should be awarded sixty days prior to the commencement of scheduled overhauls. This goal has been revised by the Chief of Naval Operations from sixty days to one hundred twenty days. The additional time was considered the minimum necessary to allow families to be moved in a more orderly manner prior to the commencement of overhauls.

The change in the schedule mandated by the CNO has required alterations to the NAVSEA, SUPSHIP, and PERA planning schedules for ship overhauls. Where once the goal was to ensure a requirements package was defined and confirmed at a work definition conference at least six months prior to the commencement of the overhaul, the goal now is to have a contract awarded by this point in time. It is now necessary

to attempt to conduct the work definition conference ten months prior to overhaul commencement. Included in this commitment is the assumption that a ship's requirements will change little during those ten months. Prior to this change in policy, defining the overhaul requirements for a ship commencing overhaul after returning from a deployment was already a significant problem. With these revised schedule objectives, only the most routine, planned requirements can be expected to remain unchanged in the overhaul packages.

The end result of these circumstances is to place the Navy in a situation in which objectives are in direct opposition to each other. Formally advertised contracts require a specific definition of work. In the case of ship overhauls this means that, if contract changes are to be minimized, work must commence as near the time of inspection and contract award as possible. Personnel requirements, however, dictate that contracts be awarded with as much delay as possible between award and overhaul commencement. During this delay crews and overhaul requirements change, directly impacting the need for additional contract changes.

The CNO has frequently stated that the recruitment and retention of quality personnel must receive priority attention. This relegation of ship overhaul requirements to a role secondary to personnel considerations is unavoidable, but it does place an additional burden on the ship overhaul system, a system that is already severely strained in its.

ability to cope with problems. The result will ultimately be more contract changes, with even more attention given to growth and new work than previously existed.

V. SUMMARY

The preceding chapters have discussed a multitude of interrelated problems, all applicable to the repair and overhaul of ships but none which can be uniquely identified as the growth and new work problem. The frustration of those who have attempted to solve the issue of growth and new work can largely be attributed to this initial issue of problem definition. When considering that growth and new work is a compilation of problems that span financial, managerial, contractual, and environmental concerns, this difficulty in precisely defining the problem is understandable. This chapter will summarize the issues that have been discussed.

CONTRACTOR PERFORMANCE INCENTIVES

One area in which there is agreement regarding overhaul problems involves a general concern for cost overruns and schedule slippages. The concern for growth and new work would be substantially less intense if ships were consistently overhauled on schedule and within budget constraints. Unfortunately, there is nothing to indicate that the Navy is moving closer to solving these problems.

In a 1979 study of the nation's shipbuilders conducted by Edward Kaitz and Associates, Kaitz found that, rather than moving closer to solving these problems, the procedures

presently used by the Navy actually compound problems. Kaitz stated:

> The private shipyard has little incentive to strive for efficiency given the current market for new construction and the contracting procedures mandated by the Department of Defense....
>
> The first goal of the private sector is corporate perpetuity. Given the vagaries of the demand for new ships, the private yard is best served by lengthening construction times and maximizing costs where (1) there is no substantial penalty for not meeting delivery schedules or cost estimates and (2) there are virtually no alternative uses for the yard's capacity. Change orders and other controversies that allow for the creation of claims are, we would allege, very often in the best long-term interests of the shipyards. When settled, these claims contain reimbursements for both direct (production) and overhead (capability) costs. [6:12]

Some problems facing the Navy, such as contractors "buying" contracts by bidding prices below their costs in the hopes of making a profit on changes, are very difficult to prove, especially since contractors are not required to provide cost breakdowns of their proposals when replying to invitations for bids. One proposed solution to this problem is to contract for the overhaul of ships through the use of cost type contracts instead of fixed price contracts. This approach has been used for submarine overhauls for many years, and was proposed by the General Accounting Office, in a 1976 report, as a technique worth exploring. [18] The Navy is presently experimenting with cost type contracts with award fee provisions for the overhaul of non-nuclear surface ships.

While cost contracts may allow the Navy to award contracts earlier and with less definitive statements of work,

cost contracts cannot be expected to solve all the Navy's overhaul problems. In addition to being administratively difficult to manage, cost contracts are innately biased in favor of the large shipyards that can comply with the detailed accounting procedures required by the Navy. The politics of the ship repair industry will undoubtedly become a factor to be considered if the Navy chooses to use cost contracts for overhauling ships smaller and less complex than the 963 class destroyers.

Finally, while cost contracts may eliminate some of the problems created when using firm fixed price contracts, there is no firm evidence to indicate that ships overhauled using cost contracts will be repaired any faster, cheaper, or better than under fixed price contracts. While award fee provisions may provide the incentives required to encourage contractors to strive for these objectives, the awards must be greater than the rewards contractors can achieve by lengthening construction times, maximizing costs, and processing contract changes and claims.

MEASURING PERFORMANCE AGAINST STANDARDS

Evaluating the success of contracting methods, contracting procedures, and contractors themselves has traditionally been more of a subjective art than an objective analytical exercise. This has been one factor tht has limited experimentation with various contract types, as well as prevented the Navy from excluding many marginal shipyards

from bidding on overhaul work. An effective evaluation system must have standards that can be easily understood and consistently applied. Developing and applying such standards is not easily accomplished, as is apparent from the way the Navy defines and applies growth and new work standards.

Compounding this requirement is the heterogeneous nature of the ship repair industry. There are many difficult questions that must be resolved before standards can be developed for comparing and evaluating overhauls performed in shipyards that control such dissimilar facilities. Each answer raises more questions regarding how standards should be maintained and implemented and how exceptions should be evaluated. The list of politically sensitive issues is almost endless, all stemming from the basic difficulty in establishing evaluative standards in an environment that resists quantification. It is just such difficulties in attempting to quantify subjective values that contributed to the acceptance of growth and new work expenditures as one way to evaluate contractor performance.

The lack of any hard data, other than total overhaul costs and duration of overhauls, for use in evaluating shipyard performance was the subject of an extensive General Accounting Office (GAO) report completed in March 1978. The report, directed primarily at the need for a better definition of shipyard mobilization requirements, tied that

shortfall directly to the need for better management control procedures in naval shipyards. [19] While it is difficult to compare two systems that differ as greatly as naval shipyards and private shipyards, many procedures the Navy uses in planning and evaluating overhauls in these two systems are similar. One procedure that is particularly similar in the two systems involves the preparation of the statement of work. Both systems include the pre-overhaul test and inspection (POT&I) from which estimates are developed that provide much of the foundation for overhaul plans. In evaluating this procedure, GAO stated:

> While this procedure appears straight forward, the validity of the estimates appears questionable because of limited standards coverages and the inaccessibility of relevant historical data. In lieu of basing job order estimates either on labor standards or historical data that accurately reflect the depth of work previously performed and the labor it actually took, manually prepared job orders in many cases replicate planning documents prepared for prior overhauls. [19:31]

Within the controlled environment of naval shipyards, where approximately two-thirds of the Navy's depot level maintenance is performed, the GAO found that "shipyards no longer place high priority on a sound methods and standards program." [19:37] Without an effective program to evaluate performance against standards, it becomes more apparent why the Navy must look elsewhere, such as to growth and new work expenditures, for management data.

One significant way the overhaul of Navy ships in private shipyards differs from the overhaul of Navy ships in

naval shipyards is in the use of accounting data. In naval shipyards, cost data is readily available throughout the overhaul. This can be contrasted to overhauls in private shipyards where most contractors restrict access to accounting data. As a result, SUPSHIPs do not have the capability to monitor contractors' overhaul costs while overhauls are in progress.

Firm fixed price contracts, used for overhauls in private shipyards, have the advantage of being simpler to administer than cost contracts, an advantage that is gained by assigning most management decisions to the contractor. One area of control the Navy agrees to relinquish when using these contracts involves the accounting for overhaul costs. Since most accounting functions are performed by contractors, information detailing how contractors' prices are developed is not available to the SUPSHIPs.

In the absence of accurate cost information or performance standards, a question arises regarding how the Navy gets the data required to plan and manage overhauls in private shipyards. The answer to this question is twofold. First, for daily decisions involving specific overhauls, SUPSHIPs must rely on their surveyors' and estimators' reviews of the contractors' figures for most decisions. The Naval Sea Systems Command's philosophy on this point is that, when a firm fixed price contract is awarded, the contractor is being paid to manage the contract. Under such

contracts, the mechanism that is supposed to keep the contractor efficient is the profit motive. Since these contracts are formally advertised, the prices established for overhaul contracts at the time of award are, by definition, considered fair and reasonable. If the contractor is efficient he will earn his profit by keeping waste to a minimum, eliminating the need for the Navy to either audit his records or to maintain a duplicate management control system to ensure waste is minimized. SUPSHIPs are therefore staffed to review contractors' compliance with contracts. Management of the overhauls is considered the responsibility of the contractors.

The second data requirement the Navy has is for information that will allow them to construct long range plans for schedules and budgets. This information is provided to NAVSEA by the SUPSHIPs in the form of Ship Departure Reports and by the PERAs in the form of Post Overhaul Analysis Reports. NAVSEA requires that these reports be completed and forwarded to both NAVSEA and the type commanders within sixty days of the completion of overhauls. The reports, in conjunction with financial accounting reports, provide the data used by the Navy to plan overhaul schedules and to prepare budgets.

While these are the reporting procedures, these requirements are not always met. Delays in submitting the reports, and omissions in the reports themselves, are common.

Examples of these problems can be found in audit reports prepared by the Naval Audit Service. In one study conducted at SUPSHIP Long Beach in March 1981, it was found that Ship Departure Reports had not been prepared for almost two years. [1:17] In another audit, conducted at SUPSHIP San Diego in January 1981, the Naval Audit Service reported:

> The required preparation and submission of extremely detailed Ship Departure Reports within stringent time-frames is a chronic point of contention between the Supervisor organizations and NAVSEA. When and if prepared, these reports purportedly provide the Fleet and Type Commanders with return costs of completed shipboard work necessary for the development of future maintenance budgets. The voluminous detail, extensive delinquencies in submission, and supporting prorations and estimates make these reports highly suspect in providing any sound basis for budgeting or other accounting purposes. [20]

Delays were also found in the submission of the Post Overhaul Analysis Reports prepared by the PERAs. Compounding these problems are the difficulties the PERAs and the SUPSHIPs encounter in substantiating the data that is included in these reports. This situation is partially caused by the absence of overhaul review systems within the SUPSHIPs and partially due to the lack of manpower resources within the PERAs and the SUPSHIPs that must be dedicated to preparing these reports.

THE NAVY'S PREFERENCE FOR THE "GROWTH" LABEL

Given the problems that occur in both short- and long-term data collection, the question returns to the validity of the use of financial reports, including the measurement of growth and new work expenditures, for use as management

data. The previous chapter discussed how the Navy's accounting system is designed to report not what was spent on growth and new work, but how much of current and prior fiscal year funds have been expended. Also discussed was how there is no general agreement at any level within the ship overhaul system regarding what should be included as growth and what should be included as new work. In addition to the inconsistent application of procedures for measuring and evaluating growth and new work discussed earlier, the measurement of growth and new work is further distorted through pressures exerted by the type commanders' representatives on the SUPSHIPs to label changes as growth work.

Part of the type commanders' preference for labeling changes as growth work stems from political considerations. As discussed earlier, large expenditures for new work are indicative of poorly planned overhauls. Large numbers of new work changes create the appearance that the type commanders buried their contractors under an unreasonable amount of work that was not included in the basic contract, causing many problems that subsequently occur. By labeling the majority of changes as growth items, the type commanders can, to a large extent, disclaim responsibility for cost overruns and schedule slippages. While this is one consideration, and probably the most sensitive issue from the viewpoint of the contractors, it is also probably the factor of least consequence to the type commanders.

Of much greater importance to the type commanders, the SUPSHIPs, and to the ships themselves are schedule considerations. To the type commanders, the system for processing change orders appears to be as agonizingly slow and inefficient as it does to the contractors. When changes are labeled as growth changes, the type commanders' representatives have much greater flexibility to approve and direct that the changes proceed. Growth funds from prior fiscal years are almost always available, and there is rarely any question about the need to proceed with a genuine growth requirement.

If new work funds are required, an additional delay is often injected into the process, since the request must often be routed for financial screening before approval can be granted. In one case this delay in receiving financial approval was observed to be almost two weeks. Such a delay can cause extraordinarily expensive repercussions if the required change affects the overhaul's critical path. It is for this reason the SUPSHIPs attempt to avoid lengthy challenges to the type commanders' requests that growth funds be used to pay for changes. The SUPSHIPs will normally choose the alternative that will allow changes to be effected as quickly as possible while allowing general compliance with the law.

The type commanders' concern for using prior fiscal years' money stems from the fact that it is very common for

current fiscal year funds to be inadequate to cover all known requirements. This is reflected in the way work definition conferences tailor overhaul requirements submitted for inclusion in work packages. Funding, rather that schedules, drives the problem. The type commanders allocate a specific amount of money for the basic contract requirements, while deferring or cancelling requirements that exceed their budgets. If funds become available after the contracts are awarded, as can occur when other overhauls are completed without using all budgeted funds, the type commanders can then direct that additional work be included in the remaining overhauls. By rearranging current and prior fiscal year funds in this manner, the type commanders can get much more work accomplished than if the funds were allowed to lapse. It was such a reassignment of funds that allowed additional work to be included in the overhaul of the USS RALEIGH, allowing many essential jobs to be performed while causing a minimum of a million dollars in overruns and adding at least four months to the overhaul.

GROWTH AND NEW WORK AS A MANAGEMENT ISSUE

Again, questions arise regarding why adequate time and funds are not factored into overhaul plans well in advance, allowing these problems to be avoided. The answer, once again, returns to the lack of an adequate reporting system that would allow data to be returned to NAVSEA and to the type commanders for developing such plans. Feedback loops

to these central managers are weak, and information provided is both late and incomplete.

When NAVSEA and the type commanders forward overhaul schedule and cost forecasts to the CNO for development of long range plans, these forecasts echo the problems that were encountered when that data was collected from the SUPSHIPs and the PERAs. After information is provided, it becomes very difficult to change the system once operational schedules are developed and budget requests are submitted. Even when it appears likely that problems will occur, the information required to refute earlier submissions remains too weak to request that schedules and budgets be changed.

The individuals involved in managing the Navy's overhaul effort find that it is a system with a span of control so wide that effecting management changes is impractical. The only alternative available to them is to attempt to make ship overhauls fit within the schedules directed by the CNO and within the budgets provided by the type commanders, using a system that, according to Kaitz, provides incentives to contractors to lengthen construction times and maximize costs. The frustration this conflict causes is compounded by shortages of personnel at the SUPSHIP and PERA levels, coupled with a workload that many find unmanageable.

An example of the problems being experienced at one SUPSHIP was observed when a contracting officer was asked about his progress in processing a particular contractor's

multi-million dollar claim for equitable adjustment, a claim that had been outstanding for almost six months. The contracting officer replied that he presently had over a thousand contract changes pending, some over a year old, and that the one claim in question was just one of several requests for equitable adjustment that exceeded several million dollars. There were simply not enough trained people available on his staff to allow the claim to be processed in a timely manner.

When the division head responsible for evaluating the claim was asked about his backlog of work, he explained that there were eight people, including himself, working in his division. In addition to the evaluation of claims, his division was responsible for evaluating overhaul bids, preparing technical advisory reports, conducting on-site surveys prior to the awarding of master ship repair contracts, negotiating contract labor rates, conducting pre-award surveys, issuing change orders, and evaluating constructive change claims as they occured. Two people in his division were temporary clerical assistants. Of the remaining six, four of his people had been on the job less than four months. Only two, including himself, had received any formal training in contract administration at all. His only comment on this situation was that he was actively looking for another position elsewhere, even if this meant leaving his chosen career field in ship repair work.

These types of problems are not limited to any one office. In an audit of SUPSHIP Long Beach completed in March 1981, the Naval Audit Service found:

> Ceiling point and manpower deficiencies have resulted in SUPSHIP not performing some necessary fuctions, falling behind in others, jeopardizing the completion of major work in progress, and incurring significant overtime to supplement the shortage of personnel. [1:3]

Commenting on conditions found at SUPSHIPs in general, the Naval Audit Service stated:

> The undermanning of SUPSHIPs has been a chronic problem since FY 1974, which was triggered by the closing of several Naval Shipyards and compounded by imposed employment limitations and increasing quantity and complexity in the assignments of Navy overhauls to private shipyards. [1:4]

The migration of experienced personnel away from the SUPSHIPs to better paying, less stressful, and more rewarding jobs with either industry or other government agencies has placed a significant strain on the ability of SUPSHIPs to perform their work. The result of this situation has been to create a downward spiral in the efficiency, effectiveness, and capabilities of the SUPSHIPs and PERAs. As personnel become more experienced in ship overhaul work, they develop the skills that make them more attractive to employers elsewhere. As personnel move to better jobs, the burden of work shifts to the remaining experienced individuals until they, too, look elsewhere for work.

In industry an expected remedy for this situation would be to send in a strong, capable, and experienced manager to direct the necessary actions to solve the problems that

exist. The Navy looks to their officer corps for such leadership. However, the officers reporting to the SUPSHIPs and PERAs are extremely limited in their authority to hire or fire or to adjust pay or benefits. Likewise, they often lack the necessary experience to take prompt action on those areas they can affect. When they finally do develop some degree of knowledge and proficiency necessary to manage the very difficult work that confronts them, they are transferred.

The decline in the quality of work performed by personnel at the SUPSHIPs and the PERAs is a problem that is generally recognized by the SUPSHIPs, the PERAs, and NAVSEA, but it is most evident to the ship repair businessmen who have performed contract work for the Navy over a period of years. It is a problem that continues to become more severe as the quality of people entering the field declines while experienced and trained personnel retire or leave the SUPSHIPs and PERAs.

Confronted with the myriad of problems facing ships in overhaul, the upgrading of the work force at the PERAs and the SUPSHIPs has become a secondary consideration. Most formal training of estimators, surveyors, and contract administration personnel is either marginal or non-existent. The SUPSHIPs and the PERAs depend heavily on attracting people from the ship repair trades to fill positions. Once new people have been hired from the trades, on-the-job

training becomes the most common way to teach them their newly required skills. Contract administration personnel are occassionally given the opportunity to attend schools, but schools that are available are very general in nature, and are not designed for solving the unique problems that occur during the overhaul of ships.

Formal training for surveyors, estimators, and specification writers is almost exclusively limited to correspondence courses. Classroom training was only recently begun, but it is a limited effort designed in the hope that required skills taught to division supervisors will be passed on to subordinates. For the most part, training has continued to receive what one manager in NAVSEA's SUPSHIP Management Program described as NAVSEA's "lowest priority."

The one common denominator that can be found in this discussion of growth and new work--a discussion that has included the Navy's need for better relations with industry, as well as the need for better contract management, better financial management, better contract specifications, better reporting systems, and particularly, better decisions at the levels where the problems are occurring--is in the people who must make it all work. When considered in these terms, growth and new work can be reduced to one single issue. Growth and new work involve the basic requirement for good management.

VI. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Measuring the dollars that are expended for growth and new work in ship overhaul contracts is an ineffective means to evaluate the management or control of ship overhauls. The allocation of dollars for growth and for new work is a financial issue involving the control of funds allocated for the repair and overhaul of ships. The Navy's management of these funds is inconsistent, varying among fleet commanders, type commanders, and SUPSHIPs. The choice of funds that are used to pay for ship repairs and overhauls has become an issue among ship repair contractors because the Navy has used the measurement of prior and current fiscal year expenditures as an inappropriate means to evaluate overhauls. It is expected that, by eliminating this as a technique for evaluating overhauls, this issue will be placed in correct perspective as a matter of internal financial control for Navy ship repair funds.

The issue of growth and new work has been assigned more value than can be justified. It is a concept that is poorly understood by both shipyard and Navy managers, an issue that has been argued for years with little to show for the effort expended. It survives as an issue not due to any innate value that measurements of growth and new work contribute to

the overhaul process, but due to the lack of any better means to evaluate overhaul management and control.

Growth and new work have taken on added significance in recent years largely because of the need for better management information as ship overhauls continue to require more time and money than schedules and budgets allow. The need for better controls has become critical in recent years as the problems facing the Navy have become greater, a situation compounded by: operational requirements that demand that depot-level maintenance be accomplished on schedule; the seriously depressed nature of the ship repair industry; the increased complexity of ship overhaul requirements; a deterioration in the quality of entry-level personnel, particularly within the SUPSHIPs, that has contributed to a decline in the quality of problem resolution at the time problems occur; and an increase in the adversarial relationship between ship repair contractors and the Navy's front-line managers.

The shortcomings of the Navy's management data, as discussed in General Accounting Office reports, is recognized by Navy managers at all levels of the ship overhaul process. The problem would have been resolved long ago if not for the prohibitive costs involved in developing a comprehensive reporting system. Naval Sea System Command figures show that payments to contractors for non-nuclear surface ship overhauls completed in 1980 totalled less than

$550 million. While the GAO has frequently faulted the Navy's management reporting system, it has not been shown that the the costs required to implement an extensive reporting system would be off-set by the savings that might be realized from the investment of additional hardware, software, and personnel required to implement a truly effective management reporting system.

RECOMMENDATIONS

1. Discontinue the use of segregated growth and new work expenditures as a means for evaluating or comparing the quality of overhauls--Procedures followed by type commanders, fleet commanders, SUPSHIPs, PERAs, and NAVSEA for measuring growth and new work are incongruous, resulting in growth and new work determinations that do not contribute to a better understanding of overhaul management. Even if such measurements could be made consistent, these values would still only show the obligations and expenditures for ship overhauls in prior and current fiscal years. Figures detailing overhaul costs show amounts spent for overhauls, and nothing more.

2. Incorporate definitions for growth and new work within a NAVSEA directive applicable to all SUPSHIPs--In the absence of specific guidance from NAVSEA, the SUPSHIPs have been required to locally establish procedures for evaluating growth and new work changes. The inconsistent procedures followed by the SUPSHIPs have, in some cases, significantly

contributed to SUPSHIP problems in managing, controlling, and evaluating current and prior fiscal year expenditures for ship repairs and overhauls.

Some activites, such as SUPSHIP Portsmouth, have promulgated definitions and procedures that not only meet local requirements, but also meet the criteria established by federal law for managing public funds. It is recommended that NAVSEA solicit definitions and procedures from all SUPSHIPs for defining, managing, and controlling growth and new work, evaluate the information provided, and promulgate the most feasible definitions and procedures from the SUPSHIPs in a NAVSEA directive. There are no definitions for growth and new work that will meet the needs, desires, and preferences of all those concerned with ship overhauls. However, once clear, concise, and proven definitions and procedures are promulgated, an identified common ground will exist to serve as a basis for future improvements.

3. Simplify SUPSHIP and PERA reporting procedures--Procedures currently followed by SUPSHIPs and PERAs fail to provide accurate, timely, and complete management data to NAVSEA. It is recommended that NAVSEA simplify reporting procedures to improve the reliability and usefulness of data collected.

4. Implement a training, hiring, and retention program to upgrade the quality of personnel within SUPSHIPs--The continuing loss of qualified and capable SUPSHIP personnel

is considered to be the primary cause of many ship overhaul problems presently being experienced. Problems that should be resolved by trained and competent waterfront managers are accumulating as disputes and claims, and subsequently surfacing at NAVSEA for resolution. Better management of these problems, at the lowest level possible, would eliminate much of the need for data NAVSEA presently requires to resolve these matters.

5. Train ships' crews to allow them to be incorporated as positive contributors to the ship overhaul process--
The cooperation and involvement of the ships' crews is frequently the factor that decides the "success" or "failure" of overhauls. In spite of the importance of capable and motivated crews, there is rarely any effort to train ships' crews regarding what to expect during overhauls, how to initiate changes to overhaul contracts, how to coordinate the ships' work with the shipyards' work, or what options are available to settle disputes that arise during overhauls. Informal commitments and constructive changes caused by misdirected efforts of ships' crews attempting to improve the quality of overhauls need to be recognized as costs the shipyards will, in some way, recover. An active program to minimize these costs is required.

AREAS FOR CONTINUING RESEARCH

The following topics are proposed as areas that may warrant additional research:

1. Compare NAVSEA ship overhaul data requirements with the SUPSHIPs' ability to provide data.

    a. Identify areas in which data can be collected using existing source documents;

    b. Identify areas where procedures can be automated.

2. Conduct a study to review the impact of personnel turnover within SUPSHIPs.

    a. Compare SUPSHIP personnel turnover with turnovers experienced in the ship repair industry and the ship construction industry, as well as within other federal government field management offices;

    b. Attempt to identify the reasons turnover occurs within the SUPSHIPs;

    c. Recommend procedures to minimize the turnover of personnel.

3. Review current procedures for training personnel at SUPSHIPs.

    a. Identify strengths and weaknesses of current training programs;

    b. Develop training programs to overcome weaknesses.

4. Develop a training program in basic overhaul procedures and contract administration procedures for ships' crews commencing overhauls.

a. Implement and evaluate the training program on a trial basis.

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